

## **CHAPTER 2**

### **DESCRIPTION OF THE CHEATHAM LAKE WATERSHED**

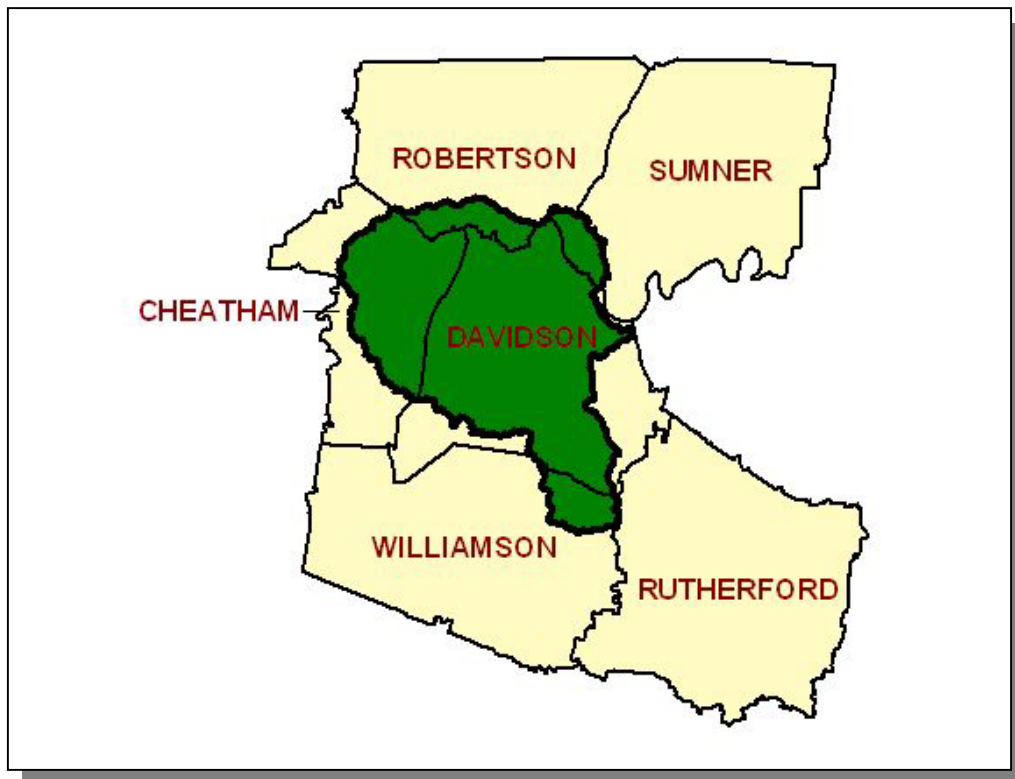
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**2.1. BACKGROUND.** Cheatham Lake is an impoundment of the Cumberland River and includes 320 miles of shoreline that extends 67.5 miles up the Cumberland River from Cheatham Dam, through Nashville, to Old Hickory Dam. The Lock and Dam were authorized by Congress in 1946 as a navigation project to enhance the development of the Cumberland River and Cheatham Lake was filled and the lock opened to the public in December 1952. The *Tennessee Blue Book* states that Cheatham County, where the lock and dam are located, was named for Edwin S. Cheatham, Speaker of the Tennessee Senate from 1855 to 1861. However, noted history holds that Cheatham County was named for the man who settled it, J.R. Cheatham. Another theory passed along since the project was completed is that it was named after Confederate General Benjamin F. Cheatham. In any case, Cheatham Lake is maintained by the U.S. Army Corps of Engineers.

This Chapter describes the location and characteristics of the Cheatham Lake Watershed.

**2.2. DESCRIPTION OF THE WATERSHED.**

**2.2.A. General Location.** The Cheatham Lake Watershed is located in Middle Tennessee and includes parts of Cheatham, Davidson, Robertson, Rutherford, Sumner, and Williamson Counties.

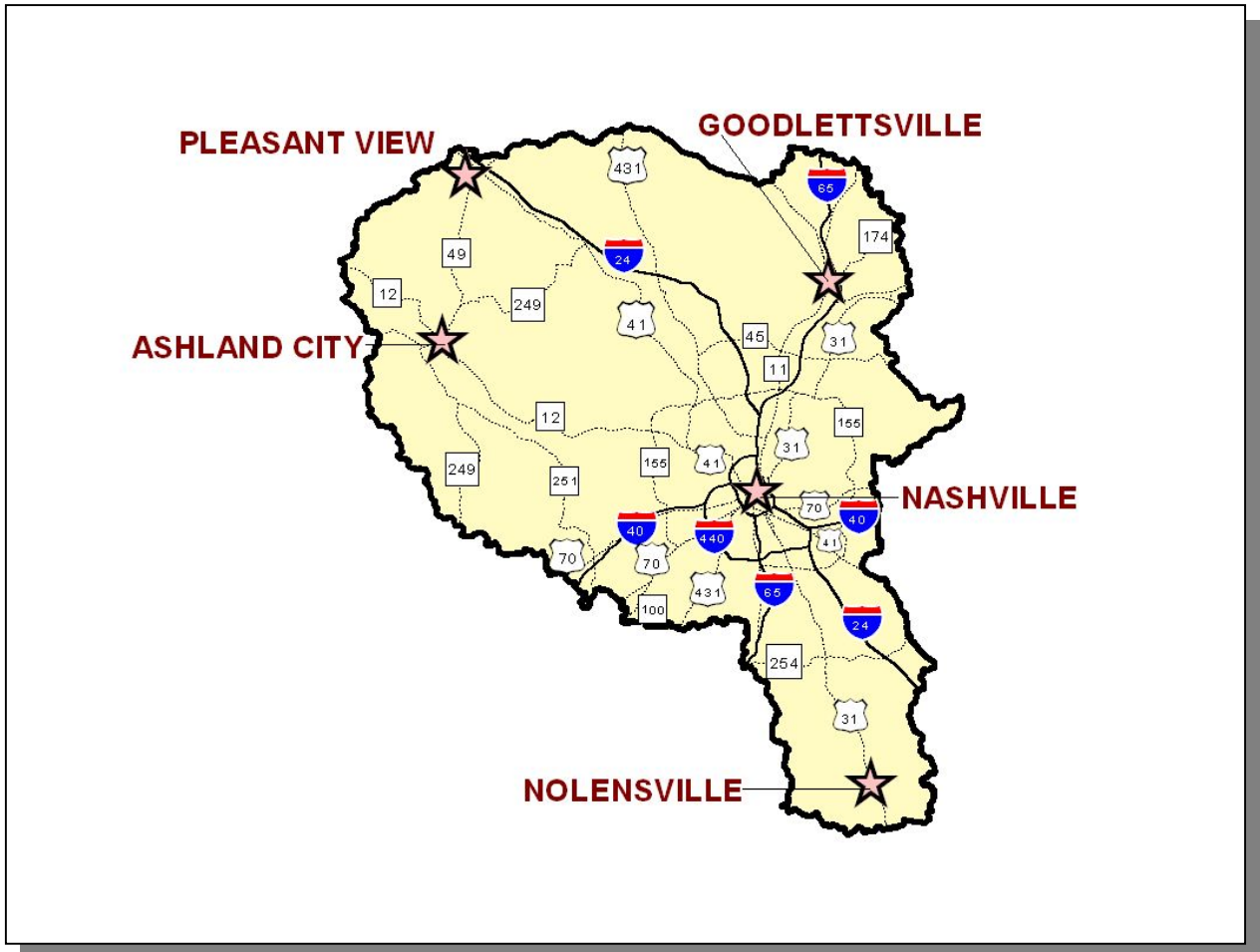


**Figure 2-1. General Location of the Cheatham Lake Watershed.**

COUNTY	% OF WATERSHED IN EACH COUNTY
Davidson	59.73
Cheatham	24.33
Robertson	6.30
Rutherford	5.50
Sumner	4.05
Williamson	0.08

**Table 2-1. The Cheatham Lake Watershed Includes Parts of Six Middle Tennessee Counties.**

**2.2.B. Population Density Centers.** Four interstates and twenty highways serve the major communities in the Cheatham Lake Watershed.



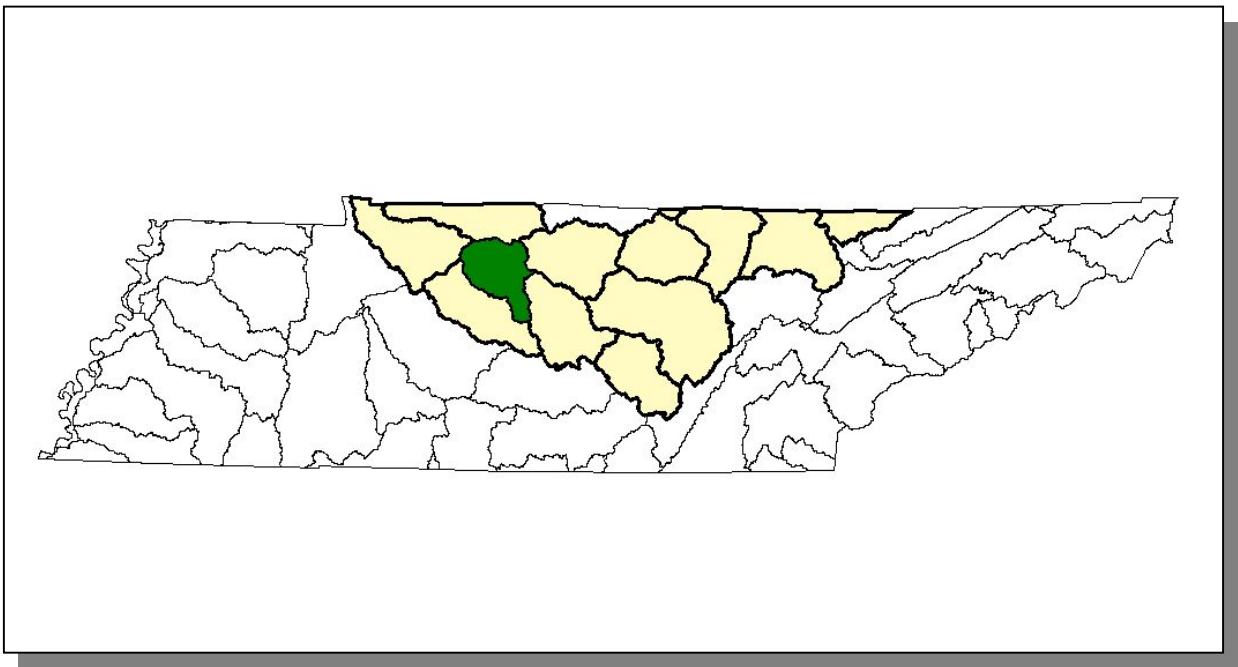
**Figure 2-2. Communities and Roads in the Cheatham Lake Watershed.**

MUNICIPALITY	POPULATION	COUNTY
Nashville*	545,524	Davidson
Goodlettsville	13,780	Sumner, Davidson
Ashland City*	3,641	Cheatham
Nolensville	3,099	Williamson
Pleasant View	544	Cheatham

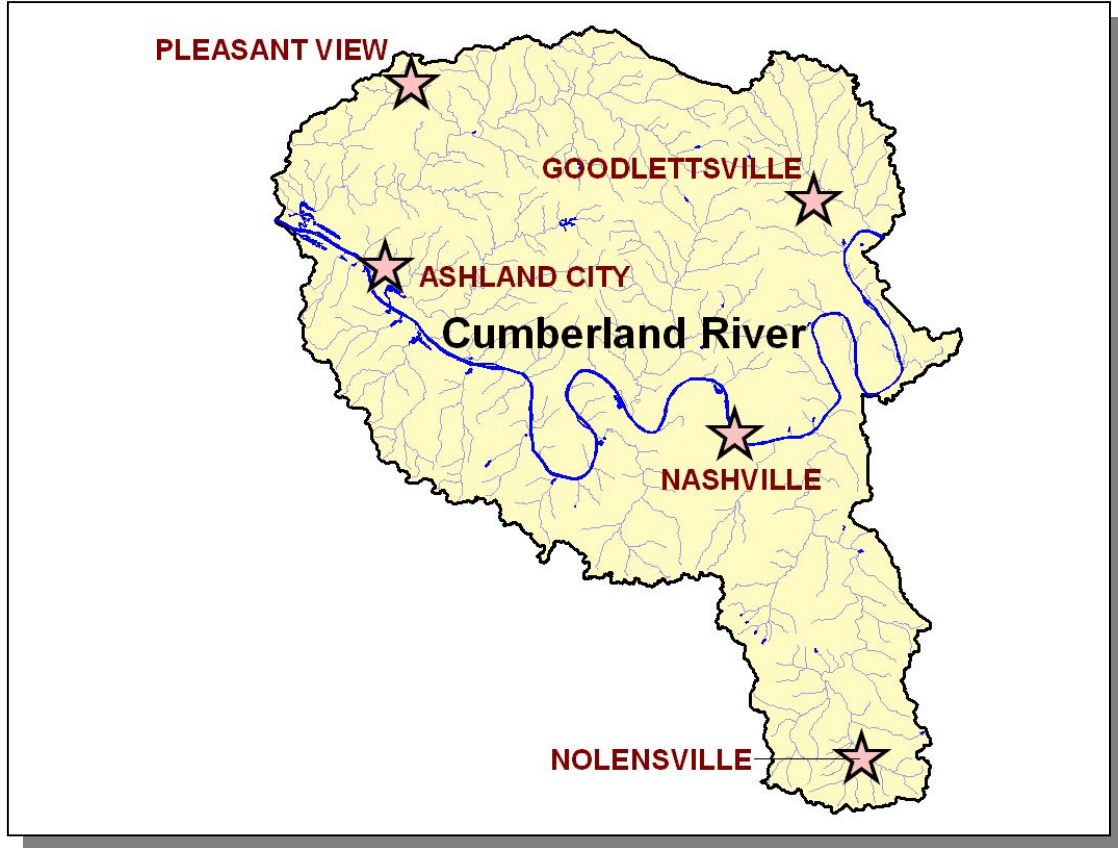
**Table 2-2. Municipalities in Cheatham Lake Watershed.** Population based on 2000 census (Tennessee Blue Book) or <http://www.hometownlocator.com>. Asterisk (\*) indicates county seat.

### **2.3. GENERAL HYDROLOGIC DESCRIPTION.**

**2.3.A. Hydrology.** The Cheatham Lake Watershed, designated 05130202 by the USGS, is approximately 647 square miles and drains to the Cumberland River.

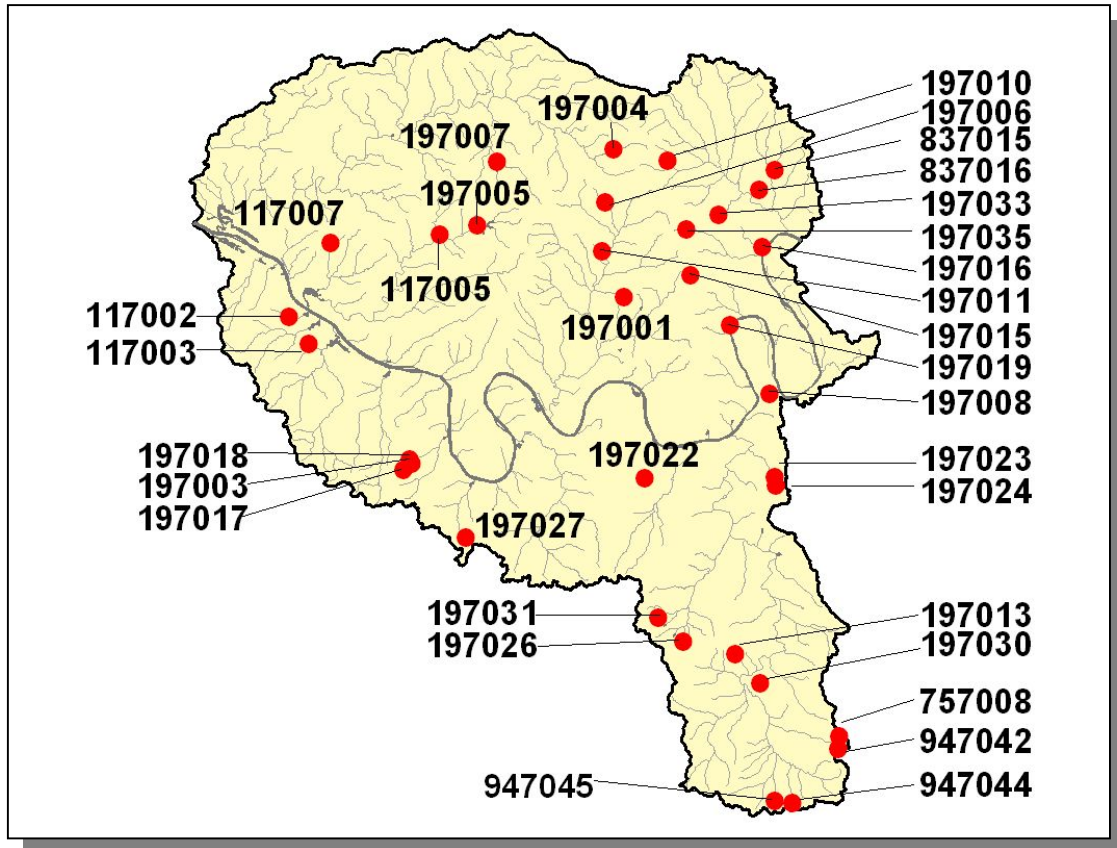


*Figure 2-3. The Cheatham Lake Watershed is Part of the Cumberland River Basin.*



**Figure 2-4. Hydrology in the Cheatham Lake Watershed.** There are 773.3 stream miles and 7,507 lake acres recorded in River Reach File 3 in the Cumberland River (Cheatham Lake) Watershed. Location of the Cumberland River, and the cities of Ashland City, Goodlettsville, Nashville, Nolensville, and Pleasant View are shown for reference.

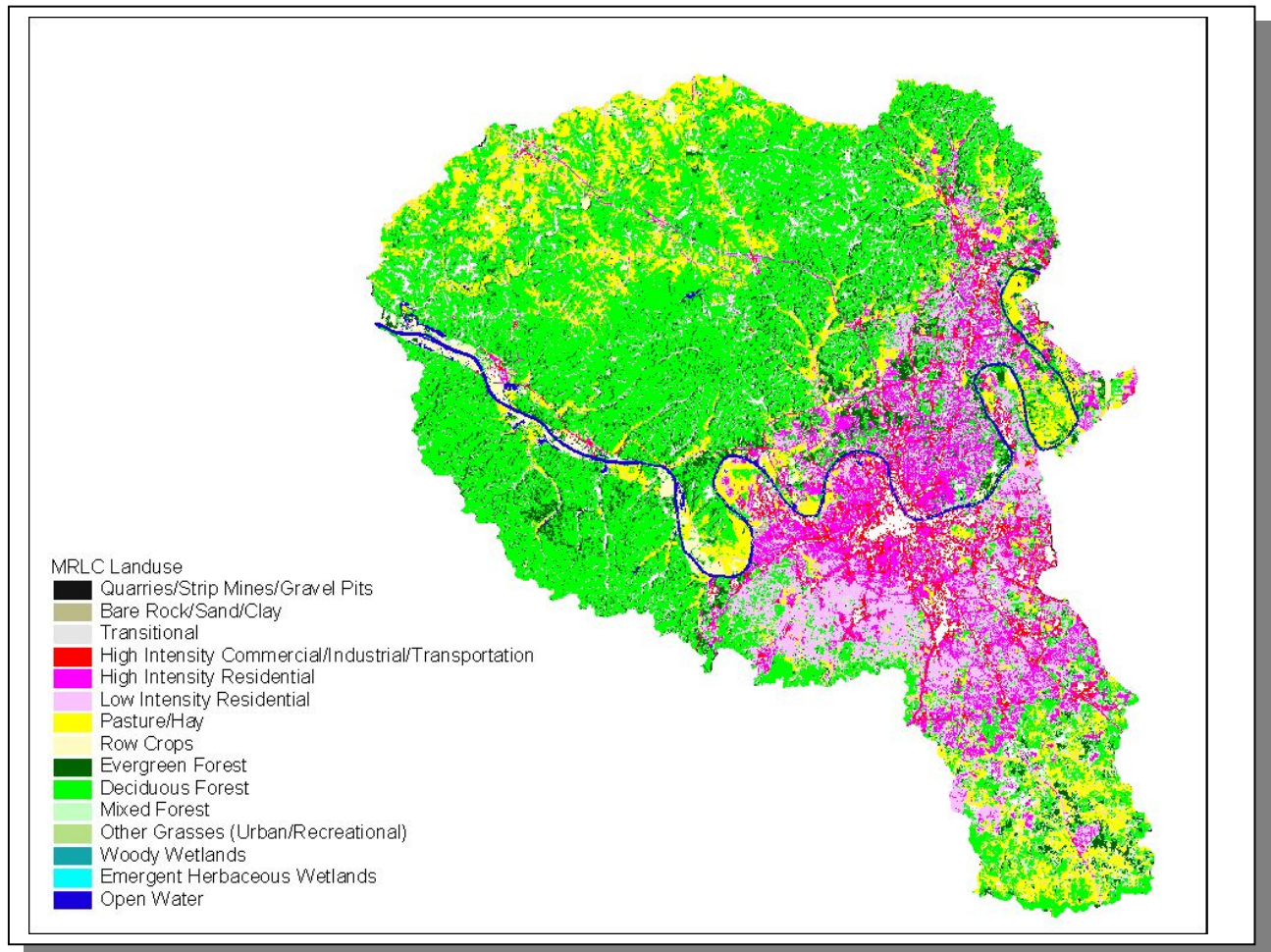
**2.3.B. Dams.** There are 34 dams inventoried by TDEC Division of Water Supply in the Cheatham Lake Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.



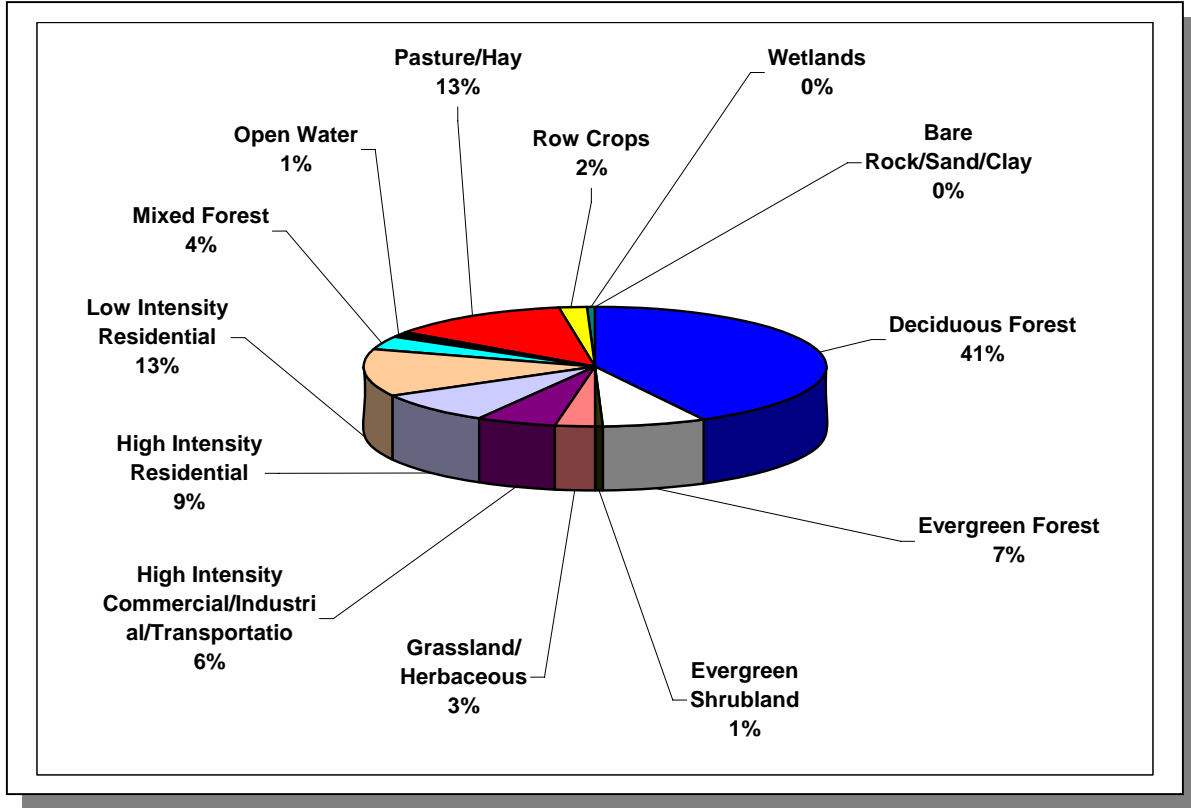
**Figure 2-5. Location of Inventoried Dams in the Cheatham Lake Watershed.** More information, including identification of inventoried dams labeled, is provided in Appendix II and at <http://gwidc.memphis.edu/website/dams/viewer.htm>.



**2.4. LAND USE.** Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 2001 Multi-Resolution Land Cover (MRLC) satellite imagery.



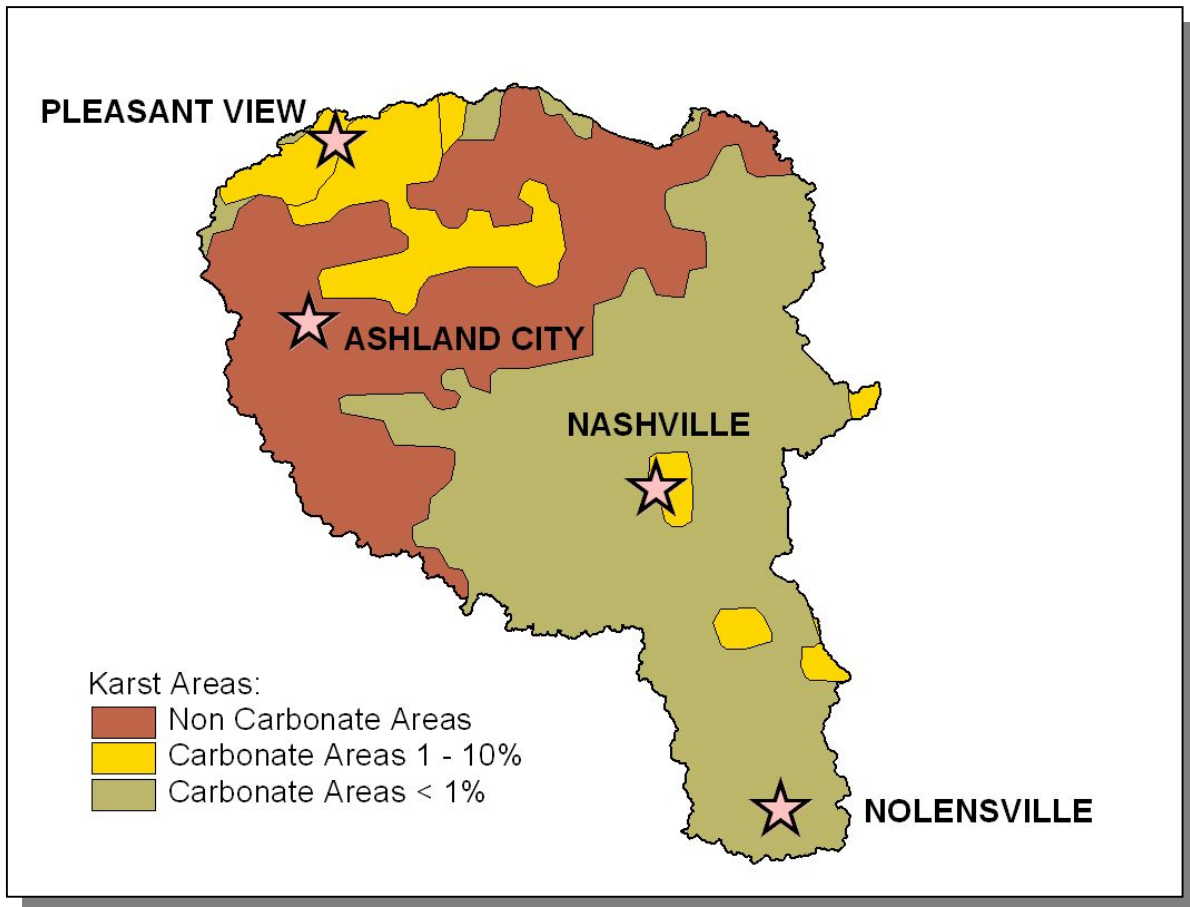
**Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.**



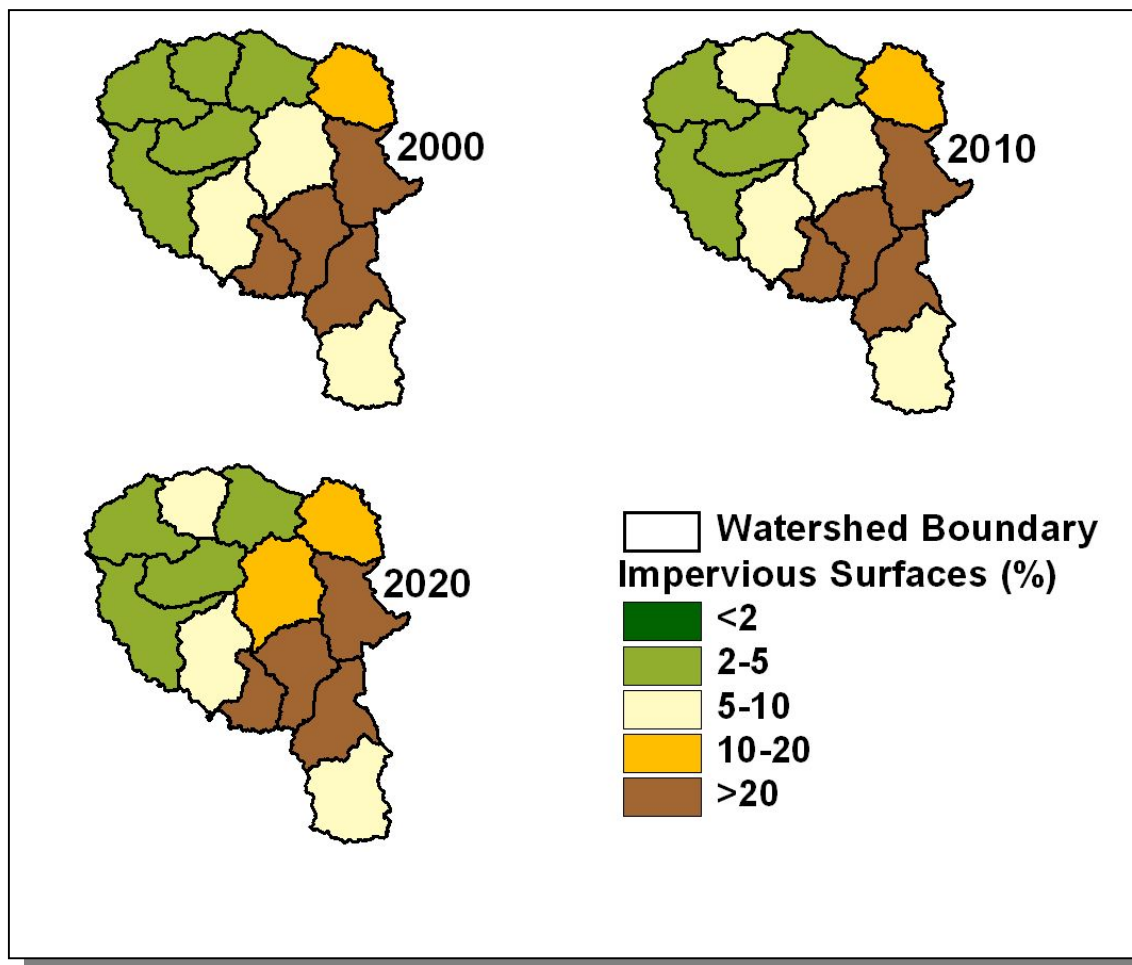
**Figure 2-7. Land Use Distribution in the Cheatham Lake Watershed.** More information is provided in Appendix II.



Sinkholes, springs, disappearing streams and caves characterize karst topography. The term “karst” describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term “karst” is named after a famous region in the former country of Yugoslavia.



**Figure 2-8. Illustration of Karst Areas in Cheatham Lake Watershed.** Locations of communities in the watershed are shown for reference.



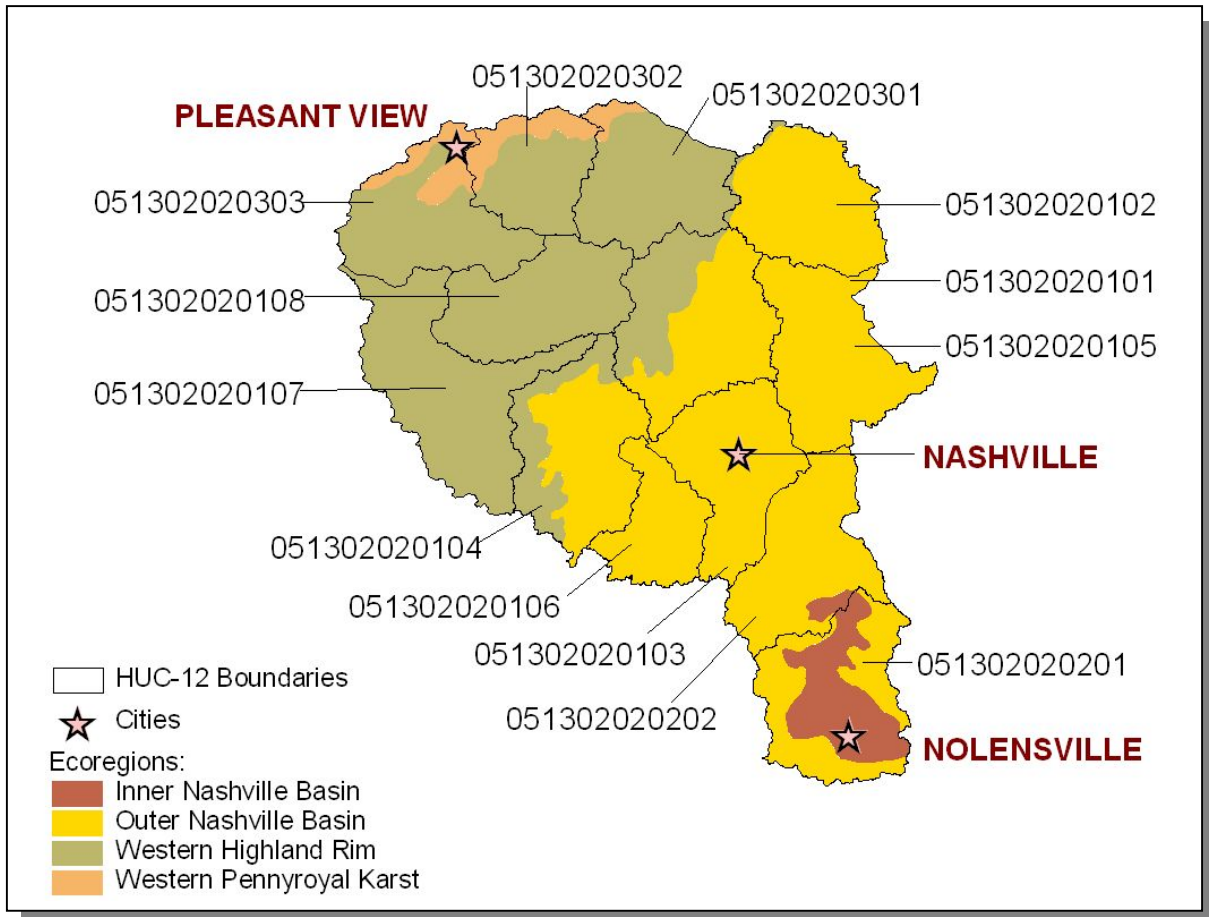
**Figure 2-9. Illustration of Total Impervious Area in the Cheatham Lake Watershed.** All HUC-12 subwatersheds are shown. Current and projected total impervious cover is provided by EPA Region 4. More information can be found at: <http://www.epa.gov/ATHENS/research/impervious/>

**2.5. ECOREGIONS AND REFERENCE STREAMS.** Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Cheatham Lake Watershed lies within 1 Level III ecoregion (Interior Plateau) and contains 4 Level IV subecoregions:

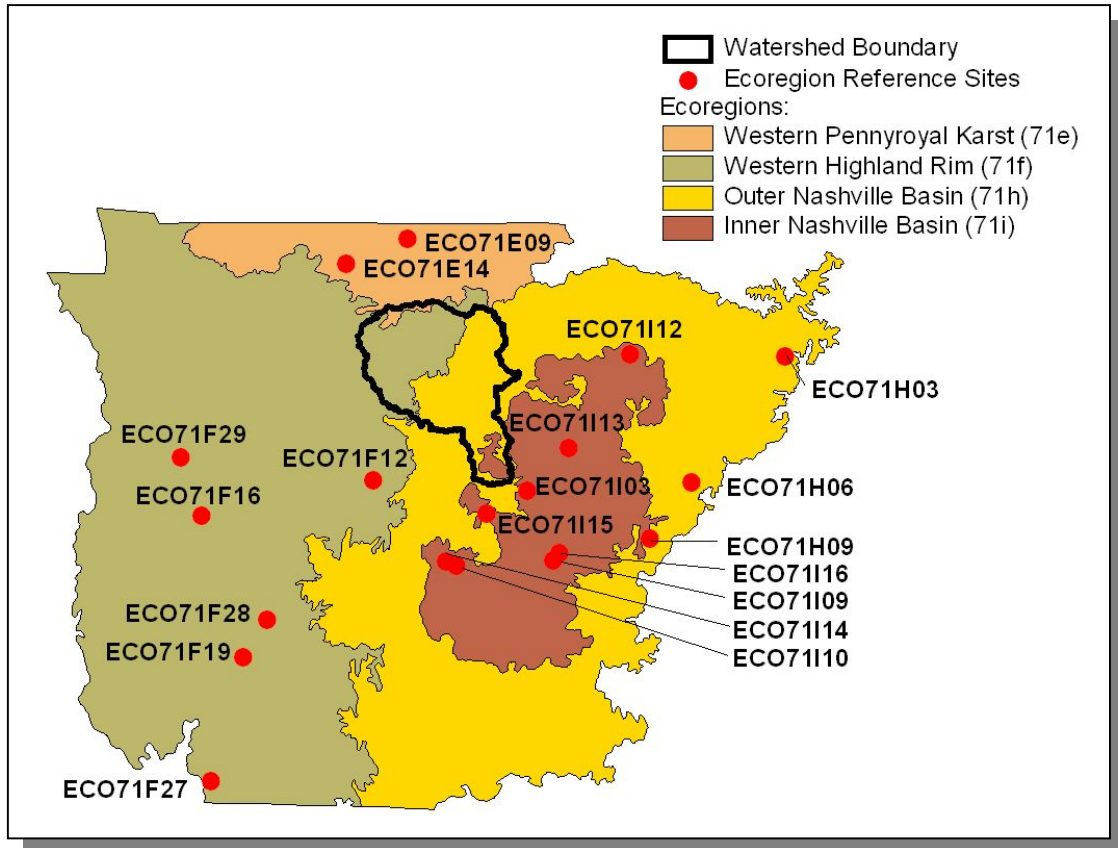
- The **Western Pennyroyal Karst (71e)** is a flatter area of irregular plains, with fewer perennial streams, compared to the open hills of the Western Highland Rim (71f). Small sinkholes and depressions are common. The productive soils of this notable agricultural area are formed mostly from a thin loess mantle over residuum of Mississippian-age limestones. Most of the region is cultivated or in pasture; tobacco and livestock are the principal agricultural products, with some corn, soybeans, and small grains. The natural vegetation consisted of oak-hickory forest with mosaics of bluestem prairie. The barrens of Kentucky that extended south into Stewart, Montgomery, and Robertson counties, were once some of the largest natural grasslands in Tennessee.
- The **Western Highland Rim (71f)** is characterized by dissected, rolling terrain of open hills, with elevations of 400 to 1000 feet. The geologic base of Mississippian-age limestone, chert, and shale is covered by soils that tend to be cherty, acidic and low to moderate in fertility. Streams are characterized by coarse chert gravel and sand substrates with areas of bedrock, moderate gradients, and relatively clear water. The oak-hickory natural vegetation was mostly deforested in the mid to late 1800's, in conjunction with the iron ore related mining and smelting of the mineral limonite, but now the region is again heavily forested. Some agriculture occurs on the flatter areas between streams and in the stream and river valleys: mostly hay, pasture, and cattle, with some cultivation of corn and tobacco.
- The **Outer Nashville Basin (71h)** is a more heterogeneous region than the Inner Nashville Basin, with more rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by the more cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forests with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

- The **Inner Nashville Basin (71i)** is less hilly and lower than the Outer Nashville Basin. Outcrops of the Ordovician-age limestone are common, and the generally shallow soils are redder and lower in phosphorus than those of the Outer Basin. Streams are lower gradient than surrounding regions, often flowing over large expanses of limestone bedrock. The most characteristic hardwoods within the Inner Basin are a maple-oak-hickory-ash association. The limestone cedar glades of Tennessee, a unique mixed grassland/forest/cedar glades vegetation type with many endemic species, are located primarily on the limestone of the Inner Nashville Basin. The more xeric, open characteristics and shallow soils of the cedar glades also result in a distinct distribution of amphibian and reptile species.



**Figure 2-10. Level IV Ecoregions in Cheatham Lake Watershed.** HUC-12 subwatershed boundaries and locations of Nashville, Nolensville, and Pleasantview are shown for reference.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.



**Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 71e, 71f, 71h and 71i.** The Cheatham Lake Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 06/01/2006, is provided in Appendix II.

## **2.6. NATURAL RESOURCES.**

**2.6.A. Rare Plants and Animals.** The Heritage Program in the TDEC Division of Natural Areas maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

<b>GROUPING</b>	<b>NUMBER OF RARE SPECIES</b>
Crustaceans	1
Insects	1
Mussels	1
Snails	0
Other	1
Amphibians	3
Birds	7
Fish	5
Mammals	2
Reptile	1
Plants	38
<b>Total</b>	<b>60</b>

**Table 2-3. There are 60 Known Rare Plant and Animal Species in the Cheatham Lake Watershed.**



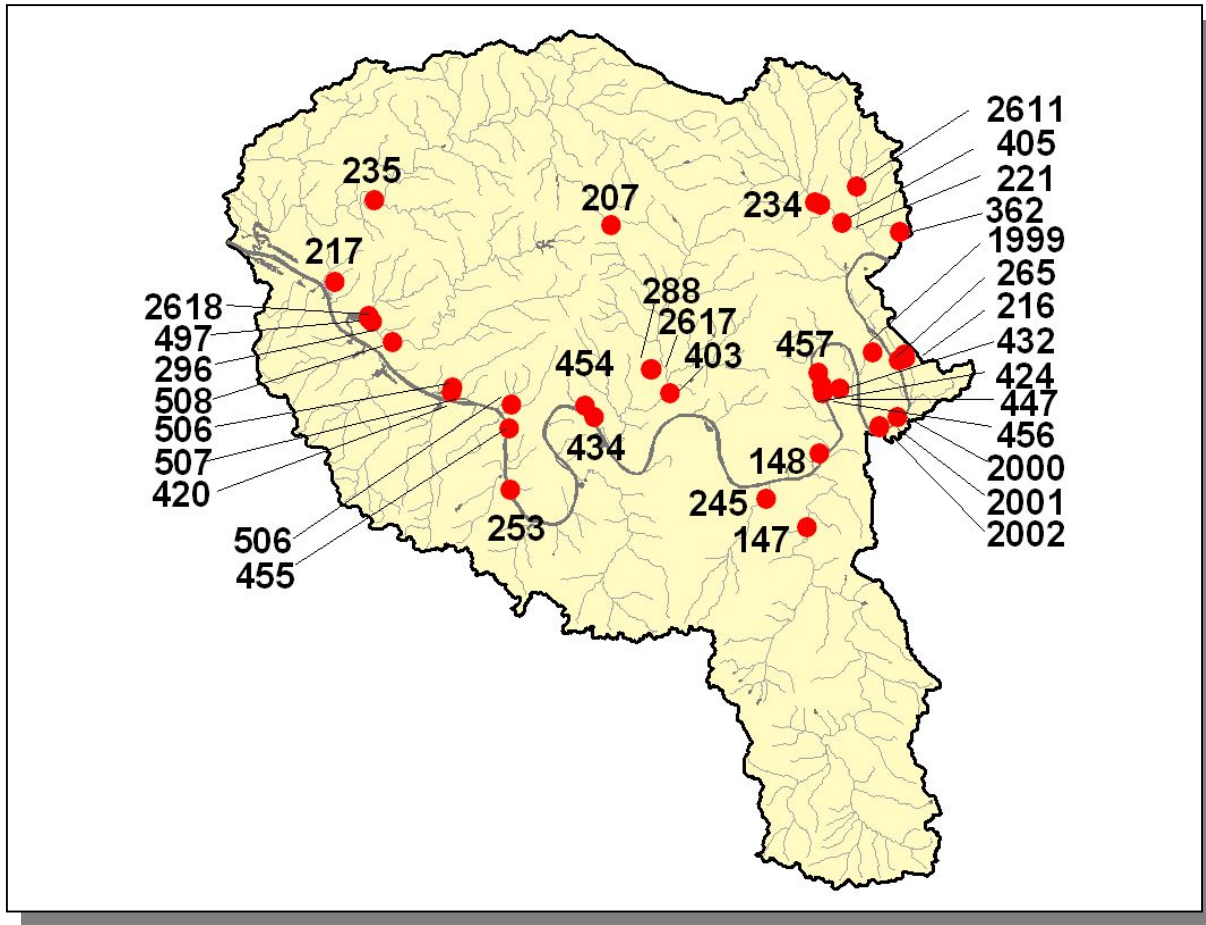
In the Cheatham Lake Watershed, there are five known rare fish species, three known rare amphibian species, one rare crustacean species, and one known rare mussel species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Acipenser fulvensis</i>	Lake sturgeon		E
<i>Etheostoma luteovinctum</i>	Redband Darter		D
<i>Etheostoma microlepidum</i>	Finescale Darter		D
<i>Cycleptus elongates</i>	Blue sucker		T
<i>Ichthyomyzon unicuspis</i>	Silver Lamprey		D
<i>Ambystoma barbouri</i>	Streamside Salamander		D
<i>Cryptobranchus alleganiensis</i>	Hellbender		D
<i>Hemidactylium scutatum</i>	Four-toed Salamander		D
<i>Orconectes shoupi</i>	Nashville Crayfish	LE	E
<i>Epioblasma brevidens</i>	Cumberlandian Combshell	LE	E

**Table 2-4. Rare Aquatic Species in the Cheatham Lake Watershed.** Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service. State Status: T, Listed Threatened by the Tennessee Wildlife Resources Agency; E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/na/>.

**2.6.B. Wetlands.** The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

<http://www.state.tn.us/environment/na/wetlands/>



**Figure 2-13. Location of Wetland Sites in TDEC Division of Natural Areas Database in Cheatham Lake Watershed.** This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.

**2.7. CULTURAL RESOURCES.**

**2.7.A. Nationwide Rivers Inventory.** The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists a portion of one stream in the Cheatham Lake Watershed:

Sycamore Creek (RM 3 to RM 17) is an excellent recreational stream with many steep scenic bluffs and forested banks and an abundance of wildlife.

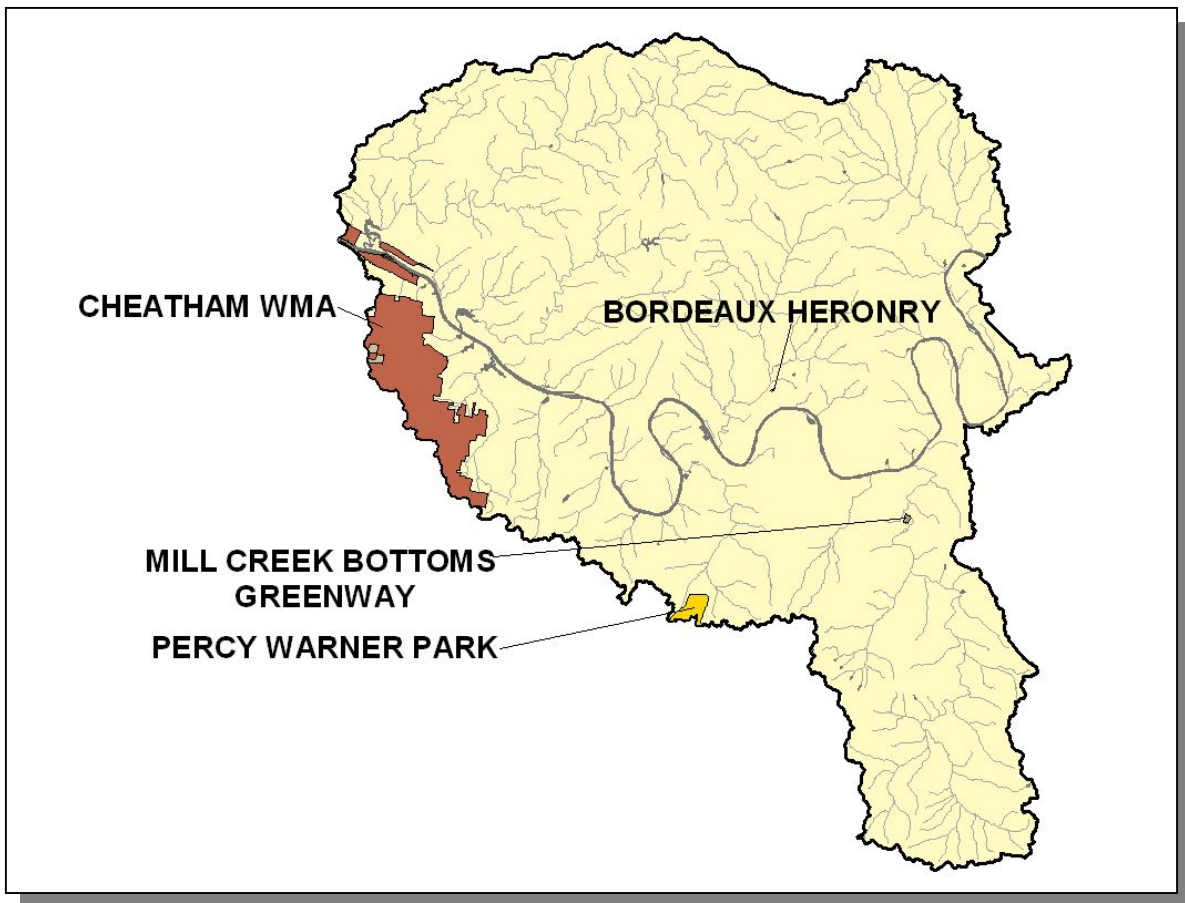
RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Sycamore Creek	X	X	X	X	X	X	X

*Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.*

Additional information may be found online at <http://www.ncrc.nps.gov/rtca/nri/>

**2.7.B. Public Lands.** Some sites representative of the cultural heritage are under state or federal protection:

- Cheatham Wildlife Management Area is a 20,800-acre property in Cheatham County managed by Tennessee Wildlife Resources Agency. More information may be found at: <http://tennessee.gov/twra/reg2wmas.html>
- Bordeaux Heronry is located in Davidson County, Tennessee and has been in existence since 1908.
- Mill Creek Bottoms Greenway currently includes three distinct segments which are either completed or under construction. More information may be found at: [http://www.nashville.gov/greenways/driving\\_directions\\_05.htm](http://www.nashville.gov/greenways/driving_directions_05.htm)
- Edwin and Percy Warner Parks, collectively known as “The Warner Parks,” comprise 2684 acres and are managed by the Metropolitan Board of Parks and Recreation of Nashville and Davidson County. More information may be found at: <http://www.nashville.gov/parks/warner.htm>



**Figure 2-15. Public Lands in the Cheatham Lake Watershed.** Data are from Tennessee Wildlife Resources Agency. WMA, Wildlife Management Area.

**2.8. TENNESSEE RIVERS ASSESSMENT PROJECT.** The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Big Bluff Creek				Mill Creek	3	3	1
Browns Creek	4		4	North Fork Sycamore Creek	2		
Bullrun Creek	3			Pond Creek	3		
Cumberland River	2,3	2	1,4	Sams Creek	2		1
Little Marrowbone Creek	3		1	South Fork Sycamore Creek	2		
Long Creek	2	3		Sulfur Branch Sycamore Creek	2	2	2
Marrowbone Creek	3	3	1	Whites Creek	3	3	2

Table 2-6. *Tennessee Rivers Assessment Project Stream Scoring in the Cheatham Lake Watershed.*

Categories: NSQ, Natural and Scenic Qualities  
RB, Recreational Boating  
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery  
2. Regional Significance; Good Fishery  
3. Local Significance; Fair Fishery  
4. Not a significant Resource; Not Assessed